

Appendix F

ENVIRONMENTAL ASSESSMENT

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Service Coordination Act Reports**

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ENVIRONMENTAL ASSESSMENT

AND

FINDING OF NO SIGNIFICANT IMPACT

FOR

NEW SAVANNAH BLUFF LOCK & DAM

PROJECT

SAVANNAH RIVER

GEORGIA AND SOUTH CAROLINA

Prepared by:
Environmental Resources Branch
U.S. Army Corps of Engineers
Savannah District

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1.0 DESCRIPTION OF THE SELECTED ALTERNATIVE AND PURPOSE

1.1 The Selected Plan

The selected alternative is to deauthorize the New Savannah Bluff Lock & Dam (NSBL&D) as an operating Federal project. Given the current poor condition and expected future deterioration of the structure, and in the absence of a non-Federal entity sponsoring reauthorization or assuming ownership of this project, the USACE, Savannah District, has no other alternative but to recommend that Congress deauthorize this project.

Deauthorization would entail complete demolition and removal of the structure. The resulting rubble would be placed along the riverbanks to provide erosion protection. Consistent with the best interest of the United States and applicable laws and regulations, the land of this project would be disposed as excess real property through the General Services Administration.

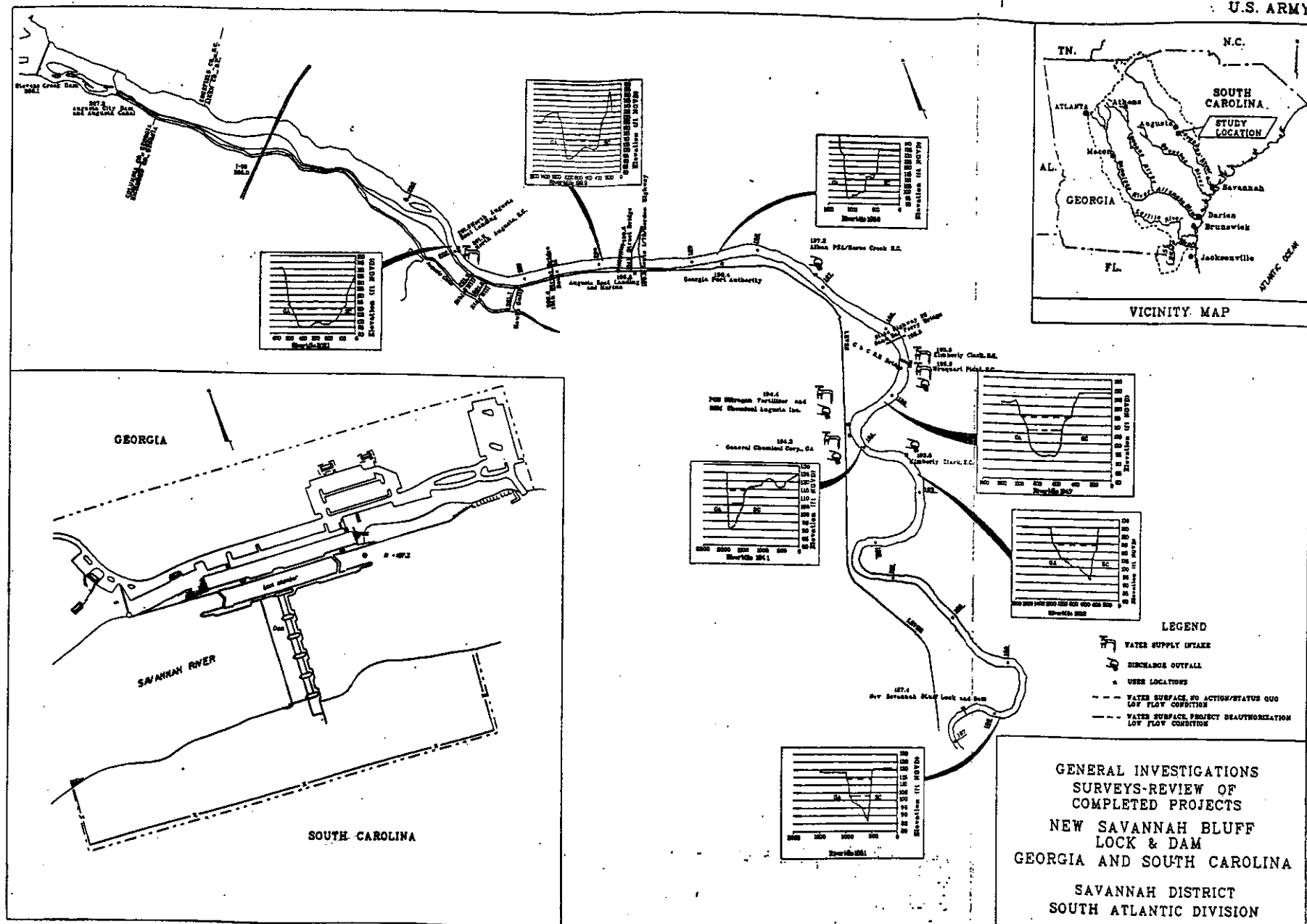
1.2 Purpose Of This Document

This Environmental Assessment (EA), as part of a Section 216 Disposition Study, has been prepared in conformance with procedures established by the National Environmental Policy Act of 1969 (NEPA) to identify impacts expected to result from implementation of the proposed action. These evaluations provide full and fair discussion of the environmental impacts of the proposed action and ensure that the decision-maker is aware of the impacts prior to a decision on proceeding with its implementation.

The Section 216 Disposition Study purpose is to determine whether there is a Federal interest in continuing the current project operations and maintenance responsibilities, and to recommend an appropriate disposition plan for the project.

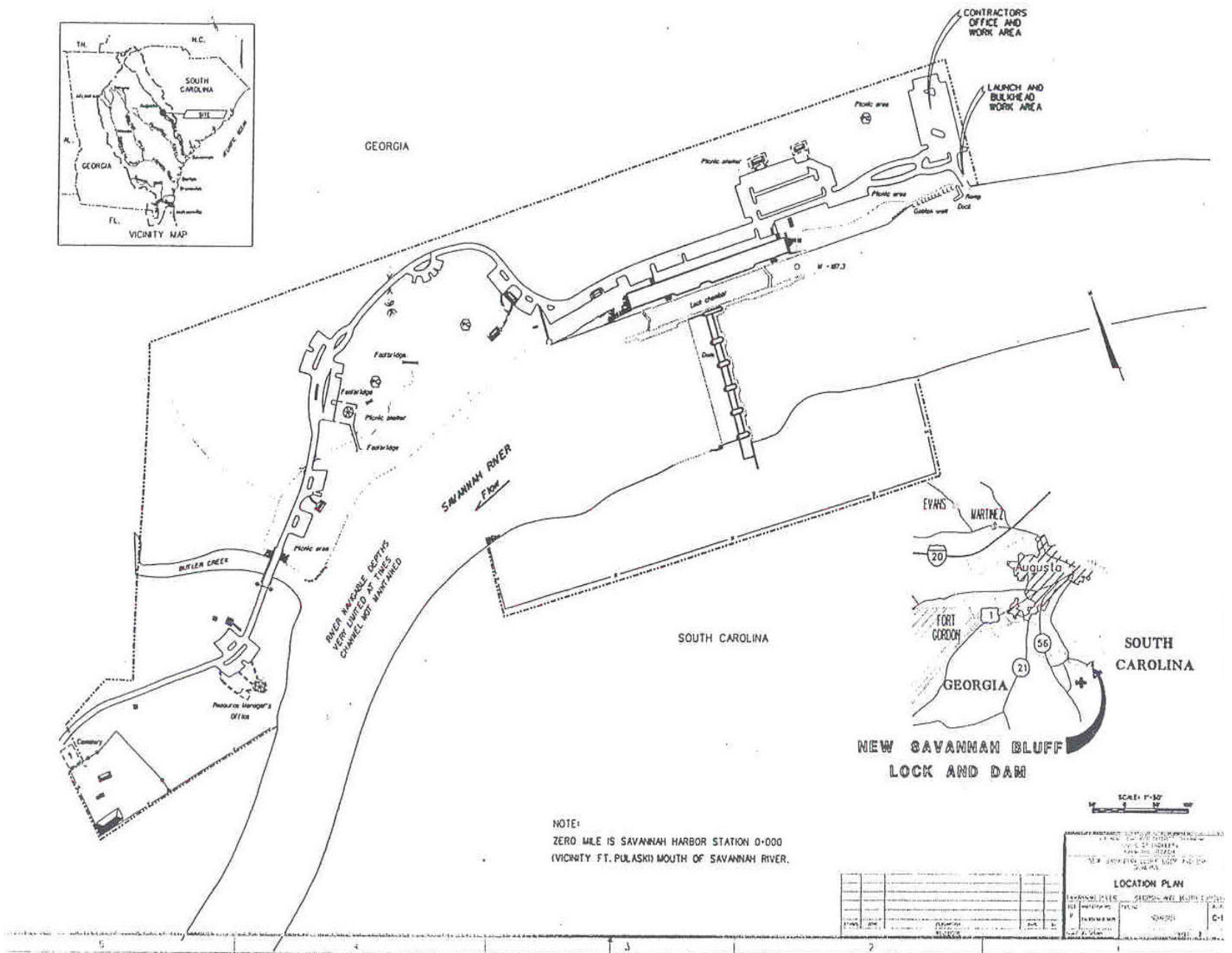
1.3 Project Location

The NSBL&D project is approximately 33 river miles downstream from the J. Strom Thurmond (JST) Dam and approximately 13 river miles downstream from the city of Augusta in Richmond County, Georgia, and the city of North Augusta in Aiken County, South Carolina. Its property lines encompass Richmond County, Georgia, and Aiken County, South Carolina. (Figure 1: Location Plan)



1.4 Project Description

Figure 2 - Study Area Map



The NSBL&D project consists of a lock chamber, a dam, an operation building and a 50-acre park and recreation area. The dam is 360 feet long with five vertical lift gates. The gates are 15 feet high and 60 feet long and are remotely controlled from the JST Dam project. The lock is on the Georgia side of the river adjacent to the dam. The lock's useable chamber is 56 feet wide and 360 feet long and the lift height is approximately 15 feet. This lock and dam, a concrete gravity structure supported by timber piles, was completed in 1937. The U.S. Army Corps of Engineers, Savannah District, operates and maintains the dam portion of the project. The city of Augusta operates and maintains the navigation lock. Richmond County operates and maintains the recreational area adjacent to the impoundment. (Figure 2: Study Area Map)

The uses of the NSBL&D project have substantially changed from those for which the project was authorized. NSBL&D was originally constructed by the U.S. Army Corps of Engineers, Savannah District, and acquired by the Federal Government in 1937 primarily in the interest of commercial navigation. Commercial navigation passing via the lock has been non-existent since 1979. In recent years, Federal funding has been insufficient to properly maintain this project, and, as a result, the structure has physically deteriorated. Currently, this project is being used and operated for incidental purposes such as ecosystem enhancement, municipal and industrial water supply and recreation.

In view of the decreased use of the lock and dam for commercial navigation, its specific authorized project purpose, Federal funding for proper maintenance and repair of the NSBL&D and the Savannah River Below Augusta (SRBA) navigation project ceased in 1979. Subsequently, the Chief of Engineers directed the Savannah District to place the lock into caretaker status. The Savannah District made preparations to permanently close the lock in April 1986. Consequently, the Savannah District held a public meeting in Augusta, Georgia to present the proposed closing of this lock. The city of Augusta expressed interest in operating the lock, park, and recreation area as an instrument for economic development and tourism. In 1987, the public park and recreation facility and the project lock were leased to the city of Augusta for operation purposes.

1.5 Project History

The NSBL&D project was established by the 1922 Rivers and Harbors Act which provided authority for the U.S. Army Corps of Engineers (USACE) to conduct a preliminary examination and survey of the Savannah River below Augusta, Georgia. The intent of this study was to provide "a channel of greater depth and dependability" to the head of navigation at Augusta by constructing "one lock with movable dam and by open river improvements". The Rivers and Harbors Act of 3 July 1930 authorized construction of this project. House Document numbered 101 of the 70th Congress, 1st Session, reports the examination and survey. It states that "the sole reason for an increase in depth is for traffic between Augusta and points beyond Savannah requiring use of the open ocean." The Public Works Administration (PWA) assembled under the National Recovery Act of 1933 authorized the lock and dam on 27 September 1933. The Rivers and Harbors Act of 30 August 1935 (Senate Committee Print, 73rd Congress, 2nd Session) established the location of this project. The 1944 Flood Control Act (Public Law 78-534) and the 1965 Federal Water Project Recreation Act (Public Law 89-72) provided general authority for adding recreational features to the project.

2.0 AFFECTED ENVIRONMENT

This chapter presents a description of the surrounding area associated with the NSBL&D and the condition of the existing environment at the location of the proposed action. The characterization of existing conditions provides a baseline for assessing the potential environmental impacts from activities associated with the proposed action. This discussion does not include information on all significant resources of the study area, since many of these would not be impacted by alternatives under consideration.

2.1 Hazardous Waste

Preliminary Assessment Screenings (PASs) are conducted to determine if hazardous substances were stored, released into the environment or structures, or disposed of on a site. The purpose of a PAS is to develop sufficient information to adequately assess the health and safety risk, define the nature, magnitude and extent of any environmental contamination, and identify the potential environmental contamination liabilities associated with a real estate property acquisition, transfer or disposal transaction. PASs were performed routinely by USACE Savannah

District personnel at the NSBL&D. A review of the PASs revealed the removal of two above and below ground tanks from NSBL&D and minor spills/leaks occurring throughout the years. There are no Installation Restoration Program (IRP) sites located in the vicinity of the proposed activity.

2.2 Jurisdictional Wetlands and Special Aquatic Sites

In response to comments received during the draft EA review, the Savannah District contracted Dial Cordy and Associates, Inc., to evaluate the potential wetland impacts that would result from lowering the pool elevation of the NSBL&D. Dial Cordy used black and white aerial photographs, National Wetland Inventory maps, USGS topographic quadrangle maps, and field verification based on the US Army Corp of Engineers' *1987 Manual for Identifying and Delineating Jurisdictional Wetlands*, to determine existing wetland areas and to project future wetland conditions if the project pool were lowered. Three different types of wetland areas were identified in the NSBL&D area including; littoral wetlands, forested fringe wetlands, and small creek systems. Phinizy Swamp, a large wetland area located north of the NSBL&D and currently under restoration by public and private entities, was given special consideration during the wetland evaluation. Likewise, the backwater floodplain wetlands located adjacent to the South Carolina Electric and Gas (SCE&G) Urquhart Station were closely examined for potential impacts. The "New Savannah Bluff Lock and Dam Wetland Evaluation Final Report" is included as Appendix E.

Upstream and partially within the pool of the NSBL&D is an area known as the Augusta shoals, one of a limited number of rocky shoals that remain not only in the Savannah River but in all of South Carolina's major Piedmont rivers. According to South Carolina Heritage Trust Advisory Board, "rocky shoals are unique biogeomorphic features that are worthy of protection in and of themselves." These habitats are given equivalent status with wetlands as special aquatic sites in the regulations implementing Section 404 of the Clean Water Act.

The Savannah River has cumulatively lost a significant portion of its Piedmont riverine habitat. Above the NSBL&D, a series of dams impounds the river. With the exception of short riverine segments, the Savannah River is essentially impounded by the large Corps of Engineers reservoirs and small hydropower projects from River Mile 207.4 to its headwaters (USFWS 1999).

2.3 Threatened and Endangered Species

A complete list of State and Federal threatened and endangered species potentially occurring in the project area can be found in the Biological Assessment of Threatened and Endangered Species (BATES) which is contained in Appendix B. Table 1 below contains the federally listed threatened and endangered species potentially occurring in the project area.

Table 1 - Federally Endangered and Threatened Species List

NAME	LISTING
Red-cockaded woodpecker (<i>Picoides borealis</i>)	Endangered
Wood stork (<i>Mycteria americana</i>)	Endangered
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered-Responsibility of NMFS
Relict trillium (<i>Trillium reliquum</i>)	Endangered
Piedmont bishop-weed (<i>Ptilimnium nodosum</i>)	Endangered
Smooth coneflower (<i>Echinacea laevigata</i>)	Endangered
Mat-forming quillwort (<i>Isoetes tegetiformans</i>)	Endangered
Michaux's sumac (<i>Rhus michauxii</i>)	Endangered
Little amphianthus (<i>Amphianthus pusillus</i>)	Threatened

2.4 Air Quality

Five air quality regions exist in the State of Georgia: northeast, northwest, southwest, southeast, and middle. Augusta is located in the northeast region. This region is in attainment for the six criteria air pollutants (CO, NO₂, O₃, PM₁₀, Pb, and SO₂) regulated by the U.S. Environmental Protection Agency (EPA).

2.5 Cultural Resources

Federal funding authority for proper maintenance of the NSBL&D stopped in 1978 when navigation ceased on the Savannah River. Since that time, only emergency repairs of the structure have been

made under the dam safety program and special legislation. The lock and dam was determined eligible for inclusion in the National Register of Historic Places at the local level of significance for architecture and engineering in 1995. This determination, however, did not alter the existing lack of funding for routine repair and maintenance activities. All emergency repairs to the structure since 1995 have been conducted in coordination with the Georgia and South Carolina State Historic Preservation Officers in compliance with the Advisory Council on Historic Preservation's regulation, 36 CFR Part 800, and the Secretary of Interior's standards for rehabilitation.

While current funding authorities have allowed for emergency repairs to the structure that are completed in a manner that complies with historic preservation regulations and standards, they have not allowed for routine maintenance of the structure that is also required by historic preservation regulations and standards. Repairs cannot be made until portions of the structure have failed or are expected to fail. This lack of maintenance has resulted in a series of adverse affects to the property that were mitigated by emergency repairs.

2.6 Land Use

The Savannah River is a major interstate river with a drainage basin of over 10,000 square miles and forms the border between the States of Georgia and South Carolina. The upper natural river system has been fragmented by a series of reservoirs. The NSBL&D project is the lowest dam on the Savannah River at River Mile 187.3, approximately 13 river miles downstream from the city of Augusta in Richmond County, Georgia, and the city of North Augusta in Aiken County, South Carolina.

The NSBL&D project is physically located just below the fall line in the Sand Hills Region of the Savannah River Watershed between the Piedmont and Upper Coastal Plain Provinces. The project affects a river reach upstream, which extends above the fall line into the Piedmont Province. The Sand Hills Region is a belt of deep sandy soils on gently sloping to strongly sloping uplands. Soils in this area were derived from marine sands, loams, and clays that were deposited on acid crystalline and metamorphic rocks. Elevation ranges from 350 to 500 feet mean sea level (Smith and Hallbick 1979, Perkins and Shaffer, 1977). The Piedmont Province consists of gently rolling to hilly slopes. This area is underlain by acid crystalline and metamorphic rock of Pre-Cambrian origin. Elevations range from 600 to 1200 feet M.S.L. (Smith and Hallbrick 1979, Perkins and Schaffer, 1977). As the river transitions from the Sandhills to the Piedmont, substrate and structure change from sandy to bedrock and cobble/gravel shoals.

Land uses surrounding the project area include recreational and commercial developments on the Georgia side and primarily agricultural uses on the South Carolina side. In its natural state, much of the area surrounding the project was forested floodplain. The city of Augusta on the Georgia side is protected with a levee.

The Piedmont area of the Savannah River and adjacent tributary streams has been converted to a series of large reservoirs (Lakes Hartwell, Richard B. Russell, and JST or Clarks Hill). These Corps of Engineers reservoirs are managed for hydroelectric power generation, flood control, recreation, and fishing. They largely control all flows in the Savannah River below them, including the project area. As a result of this regulation, the magnitude of historic high and low flows has been tempered. The effects of hydropeaking operations, are somewhat moderated by re-regulation at the Stevens Creek project, a small hydropower operation above NSBL&D. However, seasonal hypolimnetic releases and pulsing from hydropeaking operations affect the quality of aquatic habitat above the NSBL&D (USFWS 1999).

2.7 Water Quality

The water quality of the project area is generally good. There are no known significant problems in the immediate project vicinity. Seasonal dissolved oxygen problems do occur during the summer in areas upstream of the NSBL&D as a result of hydropower generation, but reaeration does occur before reaching the NSBL&D area. These dissolved oxygen problems will be reduced in the future by the operation of self-aspirating turbines at the JST Dam.

The portion of the Savannah River near the NSBL&D is classified by the South Carolina Department of Health and Environmental Control (SC DHEC) as "Freshwaters"(SCDHEC 1998). This designation is defined as:

"Freshwaters are suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses."

The Georgia Environmental Protection Division of the Georgia Department of Natural Resources has classified the project area as "Fishing" waters (GDNR 1995).

2.8 Water Supply

The NSBL&D project pool provides a municipal water supply source for the city of North Augusta. There are also five major industries in Georgia (PCS Nitrogen Fertilizer, DSM Chemical Augusta, Inc., and General Chemical Corp.) and South Carolina (Kimberly Clark and SCE&G, Urquhart Station) that use the pool for a water source.

2.9 Recreation/Socioeconomics

The most common recreational experiences that currently occur in the study area include pleasure boating, canoeing, kayaking, water skiing, jet skiing and fishing. These activities currently generate an estimated 90,000 visits annually to the NSBL&D pool. A visit constitutes one person on a one-day trip. The annual value of water-dependent, general recreation to the nation is estimated at \$92,583.

A recreational creel survey was developed by South Carolina Department of Natural Resources (SCDNR) to collect information on the recreational fishery in the immediate area of NSBL&D. The cumulative value of the recreational fishery was estimated at \$815,036 which included trip expenses plus consumer surplus. If trip expenses, consumer surplus, and durable goods were combined, a cumulative value of the NSBL&D fishery would be estimated at \$897,445.

Boat access to the NSBL&D pool is available on the South Carolina side of the river at the North Augusta ramp which is located at the head of the pool. Access on the Georgia side was available just above the lock and dam. This ramp of the Georgia side was damaged during the planned drawdown of the NSBL&D pool on January 17, 2000 and is currently inoperable. There is also a ramp below the NSBL&D on the Georgia side of the Savannah River which is currently operable. The Augusta Riverwalk Marina, located on the Georgia side of the Savannah River, has a public boat landing which is within the pool and is currently operable. There are also 64 boat slips available at this marina.

2.10 Fishery Resources

The recreational creel survey conducted in 1999 by SCDNR estimated that total angler effort in the vicinity of the NSBL&D was 126,666 hours. Approximately 45 percent of this effort was by bank anglers and 55 percent by boat anglers. The majority of angler effort was directed at American shad (28 percent of total effort). Redbreast sunfish (16 percent), channel catfish (14 percent),

bluegill (13 percent), and striped mullet (10 percent), were the other more popular species targeted. Other fish caught include black crappie, largemouth bass, redear sunfish, striped bass and yellow perch.

Currently, the JST Dam releases large amounts of water, approximately 16,000 cubic feet per second (cfs), for usually about 2 days during the month of May, in most years, to balance upstream and downstream water surface elevations at the NSBL&D. This enables non-benthic migrating anadromous fish species (primarily American shad) to pass under the vertical lift gates and over the sill of the NSBL&D. This water does generate hydropower at JST Dam. During drought years, this operation usually cannot be conducted. During normal to high flow years, it generally is conducted, but has no significant impact on hydropower generation.

In addition to the fish passage made possible by the generation releases from JST Dam, the current lease agreement between the Corps of Engineers and the city of Augusta for the NSBL&D provides 30 to 50 annual lock cycles between March 15 and June 15 for fish passage. In some recent years (1996-1998), these lock events for fish passage have not been possible due to mechanical and structural problems with the NSBL&D.

A preliminary management plan for the restoration and management of anadromous fish was developed in 1992 and endorsed by management agencies. The involved agencies are the USFWS, GADNR and SCDNR. A primary goal of this plan is to restore anadromous fish access to the base of JST Dam. If accomplished, this goal would restore access to 35.7 miles of historic anadromous fish spawning habitat.

3.0 ALTERNATIVES CONSIDERED

3.1 No Action Alternative (Status Quo)

The No Action Alternative (status quo) would most likely result in continued minimal and inadequate maintenance and no future major repair or rehabilitation of NSBL&D unless required for safety.

The existing condition of the structure is poor. The District would continue to monitor the condition of the structure through periodic inspections of the project. Accordingly, minimal necessary actions would be taken to ensure dam safety. This alternative does not offer long-term assurance that the lock and

dam will be available for fish passage, water supply, or recreation.

As the Federal steward of this resource, the Corps of Engineers must take action to prevent the occurrence of a potential catastrophic event while at the same time stop Federal spending on a project that is no longer economically justified under its existing authority and purpose. Under this alternative, minimal Federal spending for operation and minimal maintenance would continue and the potential for future problems with operation of the lock and dam would increase over time. This alternative does not offer a long-term viable solution to existing problems.

Continuation of the No Action (Base Condition) Alternative for this project would result in costs being incurred by the Federal Government for operation and minimal maintenance of the dam. Annual O&M costs for the dam are estimated at \$215,000. Annual O&M costs for the lock are estimated at \$22,000. Augusta-Richmond County would continue, under the present agreement, to incur all O&M costs of the lock, park, and recreation area.

3.2 Transfer Ownership Alternative

The transfer ownership alternative would require that a non-Federal entity assume ownership of the NSBL&D. The lock and dam would continue to exist as it presently does after undergoing extensive rehabilitation and repair. The total initial cost of this alternative is \$6,800,000. The Federal share would be \$6,100,000 and the non-Federal share would be \$700,000.

Aiken County and the city of North Augusta, South Carolina, in cooperation with SCE&G have developed a joint partnership to potentially sponsor reauthorization or own this project. They submitted a proposal in a letter dated 1 May 2000 to Dr. Joseph Westphal, Assistant Secretary of the Army, Civil Works. Their decision is contingent upon the Federal Government paying for all costs associated with immediate and future capital improvements. In addition, limited liability with ownership represents a potential concern for them.

Aiken County and the city of North Augusta have indicated they are not willing to accept a transfer with the added cost of fish passage improvement. They are not opposed to having a fishway constructed, but do not have the expertise or resources to own and operate it. The NSBL&D would continue to operate as it does presently, including the operation of the lock to permit passage of non-benthic anadromous fish species. Under this alternative, USACE would have to pursue the construction of a fishway as a separate project.

3.3 Reauthorization Alternative

For the reauthorization alternative, a non-Federal entity must be willing and able to sponsor this project. The structure would remain in place. The project reauthorization alternative consists of two major features: (1) immediate capital improvements of the lock and dam, and (2) construction of a fishway on the South Carolina property of the project to improve fish passage. The non-Federal sponsor would be responsible for a share of the structures' immediate capital improvement cost, a share of the natural fishway construction cost and all future Operation and Maintenance, Repair, Rehabilitation and Replacement (O&MRR&R) cost. The Federal Government would retain ownership of this project. The current method of using the lock to aid anadromous fish passage would continue with this alternative.

The estimated total cost of this alternative is \$12,300,000. The immediate repair and rehabilitation cost would be shared with the Federal government paying \$4,700,000 (of which approximately \$2,000,000 is allocated to water supply purposes and is to be repaid with interest by the sponsor over a 30 year period) and the non-Federal sponsor paying \$2,100,000. Estimated construction cost for the fishway is \$5,500,000. This cost would be shared with the Federal Government paying \$3,600,000 and the non-Federal sponsor paying \$1,900,000.

The fishway was designed for the South Carolina side of the dam rather than the Georgia side. The attached drawings (Figures 3-5) depict a rough layout for the fishway around the existing NSBL&D spillway structure. The channel size, length and configuration are such as to fit within the government owned land on the South Carolina side of the river. The property is only about 250-feet wide by 2500-feet long, parallel with the river. This site was chosen because the presence of the lock facility on the Georgia side would force the fishway entrance and exit locations too far upstream and downstream of the dam, decreasing the likelihood that migrating fish could find the bypass.

Criteria for the fish bypass channel, developed with input from the U.S. Fish and Wildlife Service, were:

- a. Limit mean velocity to ~ 5 feet per second.
- b. Studies have shown that an attractive flow to the fish is about 10 percent of the river flow. Therefore, maintain an attractive flow of at least 600 cfs at the fishway entrance, and at least 200 cfs through the fishway channel.

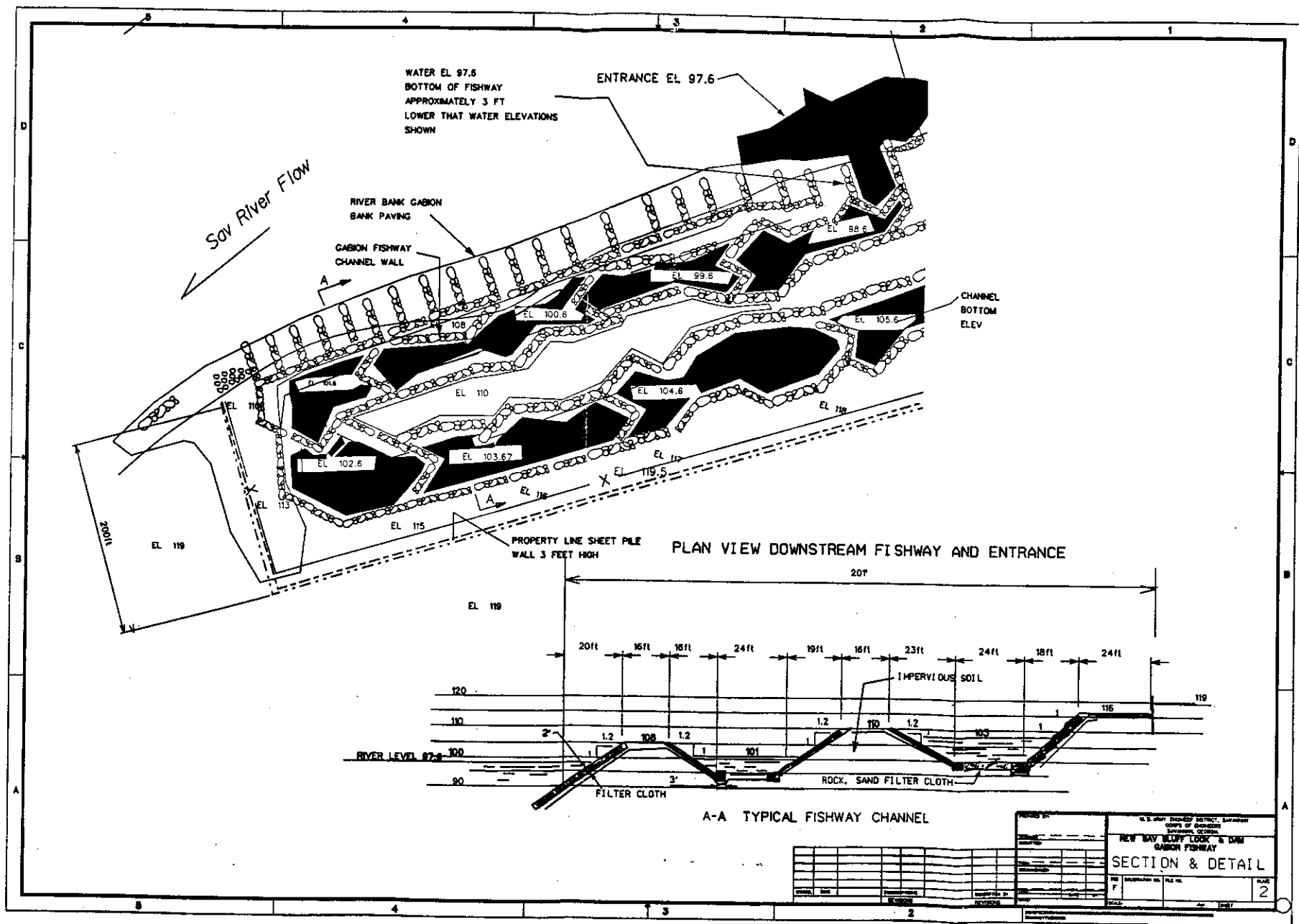
- c. The entrance and exit should be near the spillway gates so that gate-controlled flow through the South Carolina side can be used to contribute to the attractive flow.
- d. No vertical obstructions that impede bottom-oriented fish - the inlet and outlet control sections should have gradually sloping transitions to the channel.
- e. Avoid 180-degree switchbacks in flow, such as would be found at the end of a vertical divider wall.
- f. The width and depth of the channel should be non-uniform.
- g. The entire bypass should fit within the existing U.S. Government property boundary.

A channel approximately 2600 feet long, with 17 weirs spaced 150 feet apart meets these criteria. The weirs are constructed of rock, in a v-shape pointing upstream. The weirs are 1 foot lower in the center than on the sides. At the center, each weir is one foot high on the upstream side and 2 feet high on the downstream side, for a net change in elevation of one foot across each weir. The approaches to the weir slope gradually, at 30-feet horizontal per 1-foot vertical. The channel width varies between 20 and 30 feet. The channel bottom is flat in between weirs. This would provide resting pools in between the weirs. A larger resting pool which is 50-feet wide and 2-feet deeper than the other pools between weirs would be located at about the midpoint of the fishway.

Model studies indicate a projected flow depth in the fishway of 1.5 feet over the weirs and 3.5 feet between the weirs. Flows were increased above the 200 cfs minimum, to 250 cfs, in order to achieve those depths. Mean velocity is 6 ft/sec over the weirs and 2 ft/sec between the weirs, dropping off to 1 ft/sec in the larger resting pool.

To maintain the stability of the one-on-one channel side slopes, rock revetments would be needed. This would allow the fishway to be kept within the existing property boundaries. The channel revetment also has the advantage of preventing erosion due to flowing water through the channel. The river embankment would need riprap protection to keep the river from eroding the fishway entrance and exit inverts.

The intake for the fishway would consist of a short concrete channel approximately 25-feet wide. A gate structure would be required to control flow during periods of high river flows. Gates are also needed to regulate the flow in the fishway to account for some variance in the upper pool level. One or two water control gates would be used.



The attraction flow flume would be a 10-foot wide concrete channel. The slope of the channel would be considerably steeper than the fishway. Therefore the velocity of the water would be considerably higher. The flume would be used to add attraction flow to the downstream fishway entrance. The attraction flow intake would be screened to minimize fish entering the wrong channel during downstream migration. A cofferdam would be built to facilitate construction of the concrete channel at the intake to the fishway. Without the cofferdam, the dam embankment could be breached and the pool lost.

3.4 Deauthorization Alternative

Deauthorization would entail dismantling components of the structure and then demolishing the entire structure by blasting. The resulting rubble would be placed along the riverbanks to provide erosion protection. Consistent with the best interest of the United States and applicable laws and regulations, the land of this project would be disposed of as excess real property through the General Services Administration (GSA). The NSBL&D would no longer present an obstruction to anadromous fish species, and therefore no fish passage improvement would be needed. The cost of this alternative is estimated at \$5,350,000.

3.5 The Selected Alternative

The Selected Alternative is the Deauthorization alternative as discussed in Section 3.4. Since this project no longer serves its authorized purpose and in light of the deteriorated condition of the structure, the District has determined that continuation of the present condition is not a long-term viable alternative.

Aiken County and the city of North Augusta, South Carolina would consider sponsoring reauthorization or a transfer of ownership to them only if the Federal Government pays for all immediate and future repairs and rehabilitation. However, at this time, each of these alternatives requires a non-Federal entity to pay a portion of immediate and all future costs for repairs and rehabilitation.

Therefore, the District currently has no other option but to proceed with a recommendation to Congress for complete removal and deauthorization of this project. However, while the Congressional decision concerning the fate of the NSBL&D is pending, the Savannah District will continue to discuss the possibility of a transfer of ownership or the sponsorship of reauthorization of the NSBL&D with all interested parties.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Hazardous Waste

Any hazardous materials currently used or stored at NSBL&D would be properly contained and disposed of in accordance with current laws and regulations. The steel portions of the NSBL&D structure as well as other portions which would not make appropriate bank protection material would be dismantled and disposed of properly prior to demolition of the structure. Paint would also be appropriately removed from the concrete portion of the structure surfaces prior to demolition. Therefore, no significant impacts from hazardous waste are expected from the implementation of this proposed project.

4.2 Wetlands

The removal of the NSBL&D would result in the loss of 20-30 acres of wetlands. These impacted wetland areas are primarily littoral wetlands. Some small creek systems which are currently permanently flooded would exhibit only seasonal flow after removal of the NSBL&D. Existing forested fringe wetlands would shift down with the lower water level and will eventually become reestablished.

With the removal of the NSBL&D, an estimated 90-120 acres of riparian/shoal habitat would be reestablished. Shallow shoals would be created in some areas that are currently flooded by the pool, and forested fringe wetlands would shift down to the water level.

Restoration of approximately 15.7 miles of riverine habitat, a portion of which is part of the Augusta shoals, would be a cumulatively significant environmental restoration benefit of the selected deauthorization alternative. (USFWS 1999) These 15.7 miles of restored riverine habitat are considered Special Aquatic Resources under Section 404 of the Clean Water Act, having similar ecological values to emergent wetlands.

The following excerpt was taken from the Final Fish and Wildlife Coordination Act Report on the New Savannah Bluff Lock and Dam Project, Section 216 Disposition Study, August 2000, prepared by the U.S. Fish and Wildlife Service, Division of Ecological Services, Charleston, SC:

We anticipate several major riverine habitat types would be restored above the dam. In upstream reaches, rocky shoal habitat exemplified by the Augusta Shoals, would be

restored. As the river traverses the fall line its morphology changes to a narrower, deeper section with lower sinuosity and sandy substrates as opposed to bedrock shoals. This description typifies the river through the downtown Augusta area and the area of "Riverwalk". Based on observations during the demonstration "drawdown" of the river in January, 2000, riverine conditions would return above and below the fall line although rocky shoal restoration would be limited to the area above the fall line. The sandhills upper coastal plain section of the river between the fall line and the project would return to a classic sandhills river similar to the river below the New Savannah Bluff Lock and Dam. Sandy flats and point bars would be exposed. These would either be transitional features which would eventually flush downstream or relocate or longer term features which would quickly vegetate and stabilize. Several recent case studies of dam removal have demonstrated very rapid recovery of riverine sections from impounded reservoirs upon removal of the dam (American Rivers et al. 1999). From an ecological and aesthetic perspective, these areas have approached natural river recovery within just a few years. There is no reason to anticipate a different outcome above the New Savannah Bluff project.

The Phinizy Swamp and the wetlands located adjacent to the SCE&G Urquhart Station were examined for possible effects associated with removal of the NSBL&D. Phinizy Swamp's only connection to the Savannah River is through Butler Creek which flows into the Savannah River downstream of the NSBL&D. The Urquhart Station wetlands are connected to the Savannah River above the existing NSBL&D pool. Deauthorization and removal of the NSBL&D would not have an effect on either of these wetland areas.

The net effect of deauthorization and removal of the NSBL&D is an increase in wetland areas, restoration of riverine habitat, and the restoration of part of the Augusta shoals. Should the transfer of ownership or reauthorization alternative be selected, then existing wetland areas would remain as they currently exist.

4.3 Threatened and Endangered Species

Records show nine threatened or endangered species potentially occurring in Richmond County, Georgia, or Aiken County, South Carolina. The list represents those federally listed species known to occur in these counties. The selected alternative would have little if any effect on most of the threatened and endangered

species. However, the proposed project would most likely have a positive impact on the endangered Shortnose sturgeon and the rocky shoals spider lily. With the removal of the lock and dam, upstream migration would be easier for the sturgeon than it is presently. As observed during the January 2000 drawdown, the NSBL&D would have continued to present an obstacle to upstream migrating sturgeon had the dam just been taken out of service and not completely demolished and removed. This is due to the bottom oriented swimming behavior of the Shortnose sturgeon. The modification of the deauthorization alternative to include demolition and removal of the NSBL&D ensures that Shortnose sturgeon will be provided unimpeded access through the NSBL&D area.

The rocky shoals spider lily, which is proposed for Federal endangered status, was originally described from a population in the Augusta shoals. This species depends on swiftly flowing water and would likely benefit from restored riverine habitat. The State of Georgia endangered robust redhorse would also benefit from removal of the NSBL&D. Removal of the NSBL&D would provide additional riverine areas and gravel substrate spawning habitat for the possible expansion and restoration of the population which has recently been collected upstream and immediately downstream of the NSBL&D. The NSBL&D may currently act as a barrier between the individuals of this species which are above and below the dam.

This project, as proposed in the Deauthorization Alternative, would have positive effects on some of the threatened or endangered species occurring in the project area. The Biological Assessment of Threatened and Endangered Species (BATES) prepared for this project is contained in Appendix B. This proposed project has been coordinated with the USFWS to insure their concurrence with this "not likely to adversely affect" determination. The USFWS' and the National Marine Fisheries Service's (NMFS) concurrence with this determination can be found in Appendix D. The concurrence of both the USFWS and the NMFS is contingent upon the implementation of the selected alternative (deauthorization) only. Further coordination with these agencies relative to Section 7 of the Endangered Species Act would be necessary if any other alternative plan is chosen.

4.4 Air Quality

Five air quality regions exist in the State of Georgia: northeast, northwest, southwest, southeast, and middle. Augusta is located in the northeast region. This region is in attainment for the six criteria air pollutants (CO, NO₂, O₃, PM₁₀, Pb, and SO₂) regulated by the U.S. Environmental Protection Agency (EPA).

Disturbances to air quality would predominately be those caused by use of heavy equipment and blasting during the removal of the lock and dam. Engine exhaust would contribute CO and NO₂, and disturbed soil would emit particulates into the atmosphere. These increases would be minimal and temporary. Therefore, the proposed plan would not be expected to produce any significant impact on air quality.

4.5 Cultural Resources

While current funding authorities have allowed for emergency repairs to the structure that were completed in a manner that complies with historic preservation regulations and standards, they do not allow for routine maintenance of the structure that is also required by historic preservation regulations and standards.

Repairs cannot be made until portions of the structure have failed or are expected to fail. This lack of maintenance has resulted in a series of adverse affects to the property which were mitigated by emergency repairs. Deauthorization of the lock and dam project will require dismantling destruction of the structure and will constitute an adverse effect upon this National Register eligible property.

Mitigation of the adverse affect to the lock and dam could be accomplished through preservation of extant drawings and plans and through some type of architectural documentation. All of the original contract construction plans and drawings, as well as those for past repairs, are extant. The level of architectural documentation could include detailed drawings and/or photography conducted to Historic American Engineering Record standards. The level of architectural documentation required will be determined in consultation with the Georgia State Historic Preservation Officer (GASHPO). While the project lies within the states of Georgia and South Carolina, the majority of the structure lies within Georgia and the GASHPO has been designated lead historic preservation office.

4.6 Recreation/Socioeconomics

Minimal water-dependent, general recreation opportunities such as general boating and fishing which occur in the study area would be lost from a national perspective.

The American shad fishery which exists, at least partially due to the upstream migration obstruction caused by the NSBL&D, would be affected. The current bank fishery in the vicinity of the NSBL&D for this species would most likely not be as successful, and the use of a boat to pursue this species would be more essential. Increased bank and boat fishing success for American shad is

expected to occur in the Augusta shoals area since more fish would be able to reach this area after the removal of the NSBL&D. The fishing effort for other species in the area of the NSBL&D, such as the redbreast sunfish, and bluegill would not be affected. Some new opportunities for bank fishing may exist as a result of the placement of rubble from the demolition of the NSBL&D that would be placed along the riverbanks.

The boat ramp and some boat slips at the Augusta Marina would not be operable after the removal of the NSBL&D. This facility would most likely not be able to accommodate the same number of boat slips that are currently available. The existing boat ramps on the NSBL&D pool on both the Georgia and South Carolina sides of the Savannah River would not be operable after removal of the NSBL&D. These ramps would have to be redesigned and relocated or extended. The boat ramp located just below the NSBL&D would not be effected by removal of the facility. Existing private docks located within the NSBL&D pool would also have to be extended to the without pool water level.

4.7 Noise

The site of the proposed activity is in a sparsely populated area. The project would generate additional noise during the removal phase of the lock and dam. Increases in noise would predominately be caused during the temporary use of heavy equipment and blasting during the removal phase. However, no significant long-term impacts are expected from the increase in noise levels generated by this proposed project.

4.8 Water Supply

Although the NSBL&D project no longer accrues benefits from commercial navigation, it does provide incidental benefits to users of the water resource that the pool makes readily available. The project pool also provides a water supply source for the city of North Augusta and five major industries in Georgia (PCS Nitrogen Fertilizer, DSM Chemical Augusta, Inc., and General Chemical Corp.) and South Carolina (Kimberly Clark and the Urquhart Station). All of these intakes would have to undergo various degrees of alteration with the deauthorization alternative.

The city of North Augusta is completely dependent on the Savannah River for its water supply. The operation of their existing intake is dependent upon the existing project pool. Without the pool, their existing water supply intake is operable in the short-term, but limited in capacity and experiences cavitation since the pumps are not submerged a sufficient depth. They are constructing

a new intake at river mile 201.9 that is scheduled to be operational by January 2001. Once the city of North Augusta's new intake is operable, they would be able to withdraw their current average demand of 8 million gallons per day (mgd) during low flow conditions without the NSBL&D pool.

According to the river computer model simulation and information provided by industries on minimum water surface elevations required to operate intake pumps, all of the intakes of the industries, except for Urquhart Station, would be adversely impacted by low flow conditions if the pool were removed (Deauthorization Alternative). As a result, they would need to modify their intakes. Although Urquhart Station's intake would remain operable, it would take additional energy to operate their intake and they may be required to make adjustments to their system for potential thermal discharge problems.

Urquhart Station, a fossil fuel power plant, on average withdraws 157 mgd from the project pool for cooling water, and it generates 250 megawatt hours of electricity per day for approximately 220,000 homes. Without the project pool, the river computer model simulation indicates that the water surface elevation at Urquhart Station is adequate to properly operate their intake pump. During the January 2000 drawdown, Urquhart Station confirmed this information. It may cost them an additional \$25,000 annually in energy to operate their pump against additional head. In addition, there may be a problem with thermal discharge from their system. Urquhart Station's discharge permit is based on volume and other characteristics unlike the other industries whose permits are based on flow rates. An analysis would need to be conducted by Urquhart Station and reviewed by the Department of Health and Environmental Control (DHEC) to determine if there is a need to make adjustments to the temperature of the thermal discharge. The worst case scenario may require installation of a partial cooling unit to reduce the temperature of the discharge. This unit is estimated to cost approximately \$1 million.

Adjustments to water supply intakes at Kimberly Clark, PCS Nitrogen Fertilizer, and DSM Chemical Augusta, Inc., (PCS and DSM share an intake), and General Chemical Corporation, which together account for average withdrawals of approximately 26 mgd, are estimated to cost up to \$1 million for each intake.

Mason's Sod Farm has an intake in the Savannah River that would be inoperable with the absence of the NSBL&D pool. Water supply is critical during the dry summer months. It is estimated to cost approximately \$500,000 for their water supply intake to be adjusted.

**Table 2-Water Supply Users of the NSBL&D
Deauthorization Alternative**

USER NAME	COUNTY/ STATE	RIVER MILE	NPSH ¹	WITH POOL [*]	WITHOUT POOL ^{**} LOW FLOW ELEVATION
North Augusta	Aiken, S.C.	201.9	109'	115.2'	109.4'
Mason's Sod	Aiken, S.C.	195.8	112.5	115.2'	107.0'
Kimberly Clark	Aiken, S.C.	195.5	109'	115.1'	106.0'
Urquhart Station	Aiken, S.C.	195.5	105.5	115.1'	106.0'
PCS Nitrogen	Richmond, GA	194.4	110'	115.1'	105.8'
DSM Chemical	Richmond, GA	194.4	110'	115.1'	105.8'
General Chemical	Richmond, GA	194.2	111'	115.1'	105.8'

¹Net Positive Suction Head (NPSH) or minimum water surface elevation required to to operate intake pumps

^{*}Current low flow water surface elevation within the NSBL&D pool

^{**}Low Flow Water Surface Elevation at 3800 cfs after removal of the NSBL&D

4.9 Water Quality

Short-term water quality effects would result from deauthorization and removal of the NSBL&D. The demolition phase of the removal would increase sedimentation and turbidity in areas downstream from the project area. The effects of the lock and dam demolition would only be present until the removal operation is complete.

As evidenced by the January 2000 drawdown of the NSBL&D pool, some erosion and sloughing of the existing riverbanks would most likely occur. Sediment which has been deposited over time within the NSBL&D pool would be resuspended by the flowing river and would be redeposited in other areas. Reestablishment of a flowing river channel following the dam removal and revegetation of the exposed mudflat areas would take some years to accomplish. Studies and observations from other dam removal locations in the U.S. suggest that recovery to a relatively stable river channel and re-vegetation would occur within a few years (USFWS 2000).

The restoration of free-flowing river, as opposed to the current pooled water condition which currently exists in the NSBL&D area, would result in increased dissolved oxygen concentrations and lower water temperatures during the summer. Increased dissolved oxygen concentrations would be particularly apparent in the restored portions of the Augusta shoals which currently provide no re-aeration benefits under the existing pooled condition.

4.10 Environmental Justice

The selected deauthorization alternative would not affect properties owned by minority or low-income populations at a disproportionate rate. Therefore, this proposed action is in compliance with Executive Order 12898, "Federal Actions to Address Environmental Justice in minority Populations and Low-Income Populations" and does not represent disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the United States.

4.11 Fishery Resources

The selected deauthorization and removal of the NSBL&D would likely have a positive impact on fish populations in the project area. This effect would be particularly positive for the Savannah River populations of American shad, Atlantic sturgeon, Striped bass, blueback herring, hickory shad, and Shortnose sturgeon. Most of these species are in historical decline in the Savannah River system and all rely on upstream migration for successful spawning. The removal of the NSBL&D would provide unimpeded access to an additional 15.7 miles of flowing river.

Other species, such as the largemouth bass, redbreast sunfish, channel catfish, black crappie, and bluegill, have most likely benefited from the volume of habitat available in the existing "flat water" environment of the NSBL&D pool. All of these species would most likely continue to be present in the restored riverine environment; however, due to the decrease in the volume of habitat, some of these species may not be as plentiful. A large amount of "flat water" habitat and associated fishing opportunities exist just upstream of the NSBL&D in the Stevens Creek Reservoir and also in the 72,000-acre JST Lake. The loss in flat-water fishery habitat would also be somewhat ameliorated by an increase in the value of the fishery habitat in the vicinity of the lock and dam. The existing structure currently serves as a barrier to localized upstream and downstream movements of fish throughout the entire year. Removal of that structure would increase the value of the fishery habitat in the immediate vicinity. The concrete rubble that would be left along the channel banks would also provide good benthic and fishery habitat.

5.0 COORDINATION

The "Public Notice of Availability" of the draft EA and draft FONSI were sent to the public on December 20, 1999. Copies of the draft EA were sent to all interested parties including Federal, State, and local agencies. The draft EA was available for comment for 30 days after the notice was released. All comments that were received concerning the proposed project from these agencies are included in Appendix C of this final EA.

Consultation with the USFWS was conducted pursuant to Section 7 of the Endangered Species Act and the Fish and Wildlife Coordination Act. The resultant Final Fish and Wildlife Coordination Act Report can be found in Appendix D. Coordination was also conducted with the NMFS pursuant to Section 7 of the Endangered Species Act.

As a result of the USFWS' consideration of this proposed project under the Fish and Wildlife Coordination Act, the following one general and six specific recommendations were made in the "Final Fish and Wildlife Coordination Act Report, New Savannah Bluff Lock and Dam Project, Section 216 Disposition Study, August, 2000":

❖ RECOMMENDATIONS

- ❖ In order to meet the primary resource objective of reversing river fragmentation, it is important that restored or enhanced passive passage opportunities for all migratory species should be a part of any chosen alternative.

Recommendation 1. Select the dam decommissioning alternative which includes removal of the dam structure to the extent that it no longer serves as a blockage to fish movement but also develop sub-alternatives which include:

- ❖ Subsequent studies and identified remedial actions for riverine and riparian habitat restoration (e.g., sediment flushing flows, riparian plantings) above the dam.

RESPONSE: As stated in the Coordination Act Report, there is no reason to believe that the river channel and riparian vegetation would not stabilize relatively quickly without assistance. The upstream hydropower releases from JST Dam should provide a sufficient range of flows that would allow sediment flushing and redistribution.

- ❖ Subsequent studies and actions which would foster the continued high use recreational bank fishery. These should include a replacement bank angler access facility for the outer lock wall and mitigation of any lost angling opportunities through construction of fish attraction sites and improved bank angler access.

RESPONSE: Some bank angling opportunities would remain in the location of the current NSBL&D from the concrete rubble that would be placed along the banks. Bank angling should also improve in the Augusta shoals area as more fish reach these upstream locations due to the removal of the NSBL&D obstruction.

- ❖ Seeking Congressional funding or other innovative funding or financial incentives and partnerships to aid transitions for industrial, commercial and private interests which may be economically affected by project decommissioning. These monies should be obtained prior to or in conjunction with decommissioning to help mitigate incidental economic burdens due to the decommissioning.

RESPONSE: The NSBL&D was authorized by the U.S. Congress as a navigation project. As such, the doctrine of navigational servitude applies to impacts associated with operation of the project. In essence, that doctrine states that the Federal government is not legally responsible for impacts to private parties that may result from operation of the navigation project. We recognize that some adverse economic impacts will be experienced by industries, businesses, and private interests from the proposed removal of the dam. However, our evaluation of those impacts -- as summarized in the Section 216 Report -- did not reveal any entity that would receive impacts that would threaten the receiver's economic viability. Therefore, we believe that including funds in the project to mitigate for those damages is not warranted.

Recommendation 2. If the dam decommissioning and removal alternative is not selected or its selection is later supplanted by Congressional action or other factors, serious exploration of other alternatives suggested in this report should be undertaken. These include the instream rock weir alternative, modifications of the currently proposed fishway design and inclusion of a fishway in the transfer alternative.

RESPONSE: The District concurs that if the selected alternative is not implemented or is supplanted by other action, then further coordination would be required with the Fish and Wildlife Coordination Act agencies.

Recommendation 3. For any selected alternative other than the dam decommissioning and removal or instream rock weir alternatives , design and construct a passive fishway alternative which would provide unimpeded passage for all aquatic organisms in this area of the Savannah River. Such fishway should ideally be based on a natural bypass channel fishway design which incorporates construction of a morphologically natural stream segment around the dam site. The constructed stream should be designed to dissipate energy and provide suitable fish passage velocities by mimicking geomorphically natural features such as meander bends, and pool/riffle complexes. It should be noted that the SCDNR recommends a South Carolina side alternative with an educational facility and bank and boat angler access. Based on review of the site, it appears that if the navigation lock remains functional, a South Carolina side fishway may be the only effective location to attract fish into the fishway.

RESPONSE: The District concurs that if the selected alternative (dam removal) is not the alternative implemented, then further revision and design effort would be warranted relative to the fishway. This would be partially accomplished through further coordination under the Fish and Wildlife Coordination Act.

Recommendation 4. For any selected alternative other than the dam decommissioning and removal or instream rock weir alternatives, include fish passage enhancements in the lock rehabilitation plans. These consist of a new side entrance slot close to the dam and a crowder device to help fish exit the lock chamber.

RESPONSE: The District concurs that if the selected alternative is not the alternative implemented, then further review of changes to the lock design to facilitate improved fish passage should be considered. This would be partially accomplished through further coordination under the Fish and Wildlife Coordination Act.

Recommendation 5. Provide additional studies on project economics which include the positive benefits of dam decommissioning to anadromous fish stocks and consequently long term recreational and potential commercial fishing benefits, river and shoal habitat restoration and restoration of native fisheries and unique plants such as the robust redhorse and rocky shoals spider lily. Such information will require economic studies utilizing contingent valuation methods. The inclusion of such information will better balance the economics of the decommissioning alternative to which the study currently attributes no economic benefits.

RESPONSE: While the District investigated the possibility of developing economic studies on the benefits of dam removal on commercial and recreational fishing benefits, we found that sufficient data was not available on current and projected future

anadromous fish populations in the Savannah River to provide an accurate economic benefit estimate. The Corps does not normally conduct contingent valuation studies for environmental benefits.

Recommendation 6. Provide studies and simulations demonstrating the anticipated post-sediment flushed river channel morphology above the NSBL&D. While we anticipate the return of aesthetic riverine conditions for the current backwater area, the modeling and simulation of these conditions should provide a higher degree of aesthetic comfort level to those interests concerned with this element of the project.

RESPONSE: The District concurs with the USFWS position as stated in the Coordination Act Report that the river channel morphology and riparian vegetation would be stabilized and reestablished in a few years. We therefore have no current plans to conduct modeling.

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